Space Weather Forecast

Issued on Wednesday, 02 February 2022 at 01:03 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of G1-G2 Minor to Moderate Storms during day 1 (2nd February) from CME arrival. Chance Moderate-flares (R1/R2 Radio Blackouts).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low solar activity with a number of Common class flares were observed. These were mainly from two regions close to the eastern limb and the large region in the northwest quadrant of the Sun. There are also two smaller, simpler and benign regions on the visible disc. No Earth-directed CMEs (coronal mass ejections) were observed in available imagery in the last 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind slowly declined back towards ambient values, but has since increased to slightly elevated levels with the arrival of a CME at Earth. The magnetic field strength was weak, before suddenly rising to moderate levels, with the arrival of the CME (which left the Sun on 29th Jan). The important north-south component was mostly positive (northwards) during the period, before switching to negative (southward) for a time, with the arrival of the CME. Geomagnetic activity was mostly Quiet (Kp1-2), before increasing to Unsettled to Active (Kp3-4).

Energetic Particles / Solar Radiation: The count of energetic particles (high energy protons) was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Mainly Low to Moderate solar activity is expected through the period, but with a chance of isolated Moderate-class flares due to the presence of numerous fairly large sunspots, which may become unstable.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on 29 January arrived at Earth overnight on the 1st Feb, with its effects likely to continue into day 1 (2nd Feb). Solar winds are expected to be slightly elevated during day 1 (2nd Feb) after the arrival of the CME, before waning back to background levels on day 2 (3rd Feb) and into day 3 (4th Feb). Probably increasing to slightly elevated to elevated levels by day 4 (5th Feb) due to a fast wind from a coronal hole. Geomagnetic conditions are likely to be enhanced, Unsettled to Active (Kp3-4) with a Chance of G1-G2 Minor/Moderate storm intervals (Kp5-6) during day 1 (2nd Feb), before easing to Quiet to Unsettled from day 2 (3rd Feb). Probably becoming enhanced again by the weekend.

Energetic Particles / Solar Radiation: The count of energetic particles (high energy protons) is forecast to remain at background levels whilst the sunspots we are presented with remain quiet and stable, with no radiation storms currently expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	70	20	10	5
Strong	G3	No	10	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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